

US EPA ARCHIVE DOCUMENT

**State Innovation Grant Project  
Narragansett Bay Commission  
Progress Report –14  
January 1, 2012 – March 31, 2012**

**Project Title:** Sustainable Energy Management Practices for Wastewater Treatment Facilities

## **Part 1 – Synopsis of Accomplishments**

During the current Project Reporting Period January 1, 2012 through March 31, 2012 the following activities took place: the Project Partners (NBC, RIDEM, URI, National Grid, RIMES and EPA) continued to meet and participate on conference calls to discuss and plan activities associated with project development and implementation, NBC continued collecting energy use data from RI WWTFs for benchmarking, work continued on investigating the potential use of biodiesel glycerin as a wastewater treatment carbon source, NBC's Pollution Prevention Engineer continued to discuss renewable energy opportunities with RI WWTFs and continued working with URI to investigate alternative sources of anaerobic digester feed (waste) materials to help improve biogas production, NBC and National Grid worked on the completion of Phase II WWTF Energy Efficiency Technical Assessments and NBC posted the FOG-ERP Workbook on Narrabay.com.

## **Part 2 – Summary of Activities Accomplishments**

### **I. WWTF Energy Focused Environmental Management System Project**

#### **EF-EMS Steering Committee**

Throughout the current Project Period the EF-EMS Steering Committee continued to coordinate efforts with Rhode Island Office of Energy Resources (RIOER) with respect to conducting Energy Efficiency Technical Assessments (TAs) and Wastewater Treatment Facilities Energy Efficiency Upgrades. NBC previously received approval to utilize \$23,000 in ARRA grant funds remaining from the first round of 11 TAs to pay for ½ the costs of conducting additional TAs of potential energy efficiency projects participating RI WWTF. The other ½ of the TA costs being provided by National Grid. In February 2012 NBC received a two month extension to June 30, 2012 to complete the remaining TA studies. The Phase II studies being completed include:

- Bristol - Solids handling
- East Providence - Pump station
- Fields Point - Bisulfite Building
- Fields Point - Pump Station
- Newport - Solids Handling
- South Kingstown - Pump stations and Solids Handling
- Warwick – Pump Stations
- West Warwick – Head-Works and Solids Handling
- Westerly – Pump Stations

### Energy Audits/Scoping Studies and Technical Assessments

Throughout the last project period the following activities took place regarding organizing and coordinating on-going and future Energy Efficiency Technical Assessments:

- On February 13<sup>th</sup> NBC staff met with EPA staff to discuss the on-going EF-EMS project
- NBC participated in numerous conference calls and e-mail communications with National Grid regarding implementation of TA and Scoping Study findings.
- NBC and EPA made plans to conduct follow-up site visits of each WWTF

To-date Scoping Studies and/or Phase I Technical Assessments have been conducted of the following WWTFs:

Facility	Date	Energy Team Leader
Jamestown WWTF	July 1, 2009	Action Energy
Narragansett WWTF (Scarborough)	July 14, 2009	Action Energy
Bucklin Point WWTF	July 22, 2009	Action Energy
QPDC WWCP	August 25, 2009	NBC
Burrville WWTF	February 23, 2010	DMI
Smithfield WWTF	March 10, 2010	DMI
Cranston WWTF	March 24, 2010	DMI
South Kingstown	April 7, 2010	DMI
Quonset Point	April 21, 2010	DMI
Newport	April 28, 2010	DMI
Warren	May 5, 2010	DMI
East Greenwich	May 12, 2010	DMI
Bucklin Point	May 19, 2010	DMI
Jamestown	May 26, 2010	DMI
Westerly	June 9, 2010	DMI
West Warwick	June 16, 2010	DMI
East Providence	July 8, 2010	DMI
Bristol	May 2011	TNZ-TA
Bucklin Point WWTF	May 2011	TNZ-TA
East Providence	May 2011	TNZ-TA
Jamestown	May 2011	TNZ –TA

Facility	Date	Energy Team Leader
Scarborough	May 2011	TNZ –TA
Smithfield	May 2011	TNZ –TA
South Kingstown	May 2011	TNZ –TA
West Warwick	May 2011	TNZ –TA
Westerly	May 23, 2011	TNZ –TA
Woonsocket	May 2011	TNZ –TA
New Shoreham	June 29, 2011	TNZ –TA

## II. FOG Environmental Results Program Project

### Biodiesel/Glycerin

In response to a request from the NBC's Bucklin Point (BP) WWTF, investigations have been initiated into the feasibility of utilizing a glycerin by-product from the production of biodiesel as a carbon source within the BP WWTF's biological nutrient removal (BNR) process. The BP WWTF BNR process consists of nitrification in which ammonia nitrogen is oxidized to form nitrate nitrogen followed by de-nitrification in which nitrate nitrogen is reduced to nitric oxide, nitrous oxide and nitrogen gas.

In an effort to improve the effectiveness of the de-nitrification step the NBC is conducting a pilot study using glycerin, generated as a by-product from the local production of biodiesel, as a carbon source within the BNR de-nitrification process. The glycerin is injected into the anoxic zone of one aeration tank treatment train at the surface mixer. This allows for adequate mixing of the glycerin at a point within the treatment process where available carbon is at a minimum. The effect of the glycerin on treatment operation is monitored through the use of in-line sensors and sample collection and analysis.

In January 2012 a pilot study was performed using a bench-top reactor set-up in an in-door laboratory. The results of this pilot test indicate that the biological kinetics of the biodiesel glycerin compare well with other potential carbon sources. A second sample collection pilot study is planned for April 2011. No SIG grant funds are being used for this study.

### Restaurant FOG Self-Certification Workbook

A finalized FOG Self-Certification Workbook has been posted on [narrabay.com](http://narrabay.com) for access by local restaurants and food-service businesses.

### URI Anaerobic Digestion Biogas Project

Throughout this project period NBC continued efforts with URI regarding research on anaerobic digestion by supplying URI with various samples of digester sludge from the BP WWTF.

## III. Miscellaneous Activities

## **Part 3 – Projection of Activities, Accomplishments, and Major Expenditures for Next Quarter Report**

### **I. WWTF Energy Focused Environmental Management System Project**

- A Roundtable Meeting will be scheduled for May/June 2012
- Complete Phase II of the Energy Use Technical Assessments in cooperation with National Grid and the RIOER by June 30 2012
- Conduct EF-EMS follow-up meetings with all 19 WWTFs

### **II. FOG Environmental Results Program Project**

- Distribute FOG-ERP Workbook – Mail out letters to all food service businesses regarding the FOG ERP
- FOG-ERP Steering Committee – Form Steering Committee and schedule first meeting

## **Part 4 – Financial Report**

Confidential financial business information removed by EPA.

### **Attachments:**

1. Project Milestone Summary Table